IN THE CLAIMS

1. (Currently Amended) A method comprising:

monitoring consumption of a sputter target to determine a deposition rate of a metal layer during metal deposition processing using the sputter target;

modeling a dependence of the deposition rate on at least one of deposition plasma power and deposition time, modeling said dependence of the deposition rate comprising using sensor data relating to metal deposition processing for performing said modeling;

modeling a dependence of the deposition rate [[based upon]] <u>on</u> a target life of the sputter target; and

applying the deposition rate model to modify the metal deposition processing to form the metal layer to approach a desired thickness.

2. (Canceled)

3. (Original) The method of claim 1, wherein modeling the dependence of the deposition rate on the at least one of the deposition plasma power and the deposition time comprises modeling the dependence of the deposition rate on both the deposition plasma power and the deposition time.

4. (Canceled)

5. (Original) The method of claim 1, wherein applying the deposition rate model to modify the metal deposition processing comprises inverting the deposition rate model to determine the at least one of the deposition plasma power and the deposition time to form the metal layer to have the desired thickness.

6. (Canceled)

7. (Original) The method of claim 3, wherein applying the deposition rate model to modify the metal deposition processing comprises inverting the deposition rate model to determine the deposition plasma power and the deposition time to form the metal layer to have the desired thickness.

8. (Currently Amended) The method of claim [[4]] 3, wherein applying the deposition rate model to modify the metal deposition processing comprises inverting the deposition rate model to determine the deposition plasma power and the deposition time to form the metal layer to have the desired thickness.

9. (Original) The method of claim 1, wherein modeling the dependence of the deposition rate on the at least one of the deposition plasma power and the deposition time comprises fitting previously collected metal deposition processing data using at least one of polynomial curve fitting, least squares fitting, polynomial least squares fitting, non polynomial least squares fitting, weighted least squares fitting, weighted polynomial least squares fitting, and weighted non polynomial least squares fitting.

10. (Previously Presented) The method of claim 1, wherein modeling the dependence of the deposition rate on the target life of the sputter target comprises fitting previously collected metal deposition processing data using at least one of polynomial curve fitting, least squares fitting, polynomial least squares fitting, non polynomial least squares fitting, weighted least squares fitting, weighted polynomial least squares fitting, and weighted non polynomial least squares fitting.

11. (Currently Amended) A computer readable, program storage device, encoded with instructions that, when executed by a computer, perform a method comprising:

monitoring consumption of a sputter target to determine a deposition rate of a metal layer during metal deposition processing using the sputter target;

modeling a dependence of the deposition rate on at least one of deposition plasma power and deposition time, modeling said dependence of the deposition rate comprising using sensor data relating to metal deposition processing for performing said modeling;

modeling a dependence of the deposition rate [[based upon]] <u>on</u> a target life of the sputter target; and

applying the deposition rate model to modify the metal deposition processing to form the metal layer to have a desired thickness.

12. (Canceled)

13. (Original) The device of claim 11, wherein modeling the dependence of the deposition rate on the at least one of the deposition plasma power and the deposition time comprises modeling the dependence of the deposition rate on both the deposition plasma power and the deposition time.

14. (Canceled)

15. (Original) The device of claim 11, wherein applying the deposition rate model to modify the metal deposition processing comprises inverting the deposition rate model to determine the at least one of the deposition plasma power and the deposition time to form the metal layer to have the desired thickness.

16. (Canceled)

17. (Original) The device of claim 13, wherein applying the deposition rate model to modify the metal deposition processing comprises inverting the deposition rate model to determine the deposition plasma power and the deposition time to form the metal layer to have the desired thickness.

18. (Currently Amended) The device of claim [[14]] 13, wherein applying the deposition rate model to modify the metal deposition processing comprises inverting the deposition rate model to determine the deposition plasma power and the deposition time to form the metal layer to have the desired thickness.

19. (Original) The device of claim 11, wherein modeling the dependence of the deposition rate on the at least one of the deposition plasma power and the deposition time comprises fitting previously collected metal deposition processing data using at least one of polynomial curve fitting, least squares fitting, polynomial least squares fitting, non polynomial least squares fitting, weighted least squares fitting, weighted polynomial least squares fitting, and weighted non polynomial least squares fitting.

20. (Previously Presented) The device of claim 11, wherein modeling the dependence of the deposition rate on the target life of the sputter target comprises fitting previously collected metal deposition processing data using at least one of polynomial curve fitting, least squares fitting, polynomial least squares fitting, non polynomial least squares fitting, weighted least squares fitting, weighted polynomial least squares fitting, and weighted non polynomial least squares fitting.

21. (Currently Amended) A computer programmed to perform a method comprising:

monitoring consumption of a sputter target to determine a deposition rate of a metal layer during metal deposition processing using the sputter target;

modeling a dependence of the deposition rate on at least one of deposition plasma power and deposition time, modeling said dependence of the deposition rate comprising using sensor data relating to metal deposition processing for performing said modeling;

modeling a dependence of the deposition rate [[based upon]] <u>on</u> a target life of the sputter target; and

applying the deposition rate model to modify the metal deposition processing to form the metal layer to have a desired thickness.

22. (Canceled)

23. (Original) The computer of claim 21, wherein modeling the dependence of the deposition rate on the at least one of the deposition plasma power and the deposition time comprises modeling the dependence of the deposition rate on both the deposition plasma power and the deposition time.

24. (Canceled)

25. (Original) The computer of claim 21, wherein applying the deposition rate model to modify the metal deposition processing comprises inverting the deposition rate model to determine the at least one of the deposition plasma power and the deposition time to form the metal layer to have the desired thickness.

26. (Canceled)

27. (Original) The computer of claim 23, wherein applying the deposition rate model to modify the metal deposition processing comprises inverting the deposition rate model to determine the deposition plasma power and the deposition time to form the metal layer to have the desired thickness.

28. (Currently Amended) The computer of claim [[24]] 23, wherein applying the deposition rate model to modify the metal deposition processing comprises inverting the deposition rate model to determine the deposition plasma power and the deposition time to form the metal layer to have the desired thickness.

29. (Original) The computer of claim 21, wherein modeling the dependence of the deposition rate on the at least one of the deposition plasma power and the deposition time comprises fitting previously collected metal deposition processing data using at least one of polynomial curve fitting, least squares fitting, polynomial least squares fitting, non polynomial least squares fitting, weighted least squares fitting, weighted polynomial least squares fitting, and weighted non polynomial least squares fitting.

30. (Previously Presented) The computer of claim 21, wherein modeling the dependence of the deposition rate on the target life of the sputter target comprises fitting previously collected metal deposition processing data using at least one of polynomial curve fitting, least squares fitting, polynomial least squares fitting, non polynomial least squares fitting, weighted least squares fitting, weighted polynomial least squares fitting, and weighted non polynomial least squares fitting.

31. (Currently Amended) A method comprising:

monitoring consumption of a sputter target to determine a deposition rate of a metal layer during metal deposition processing using the sputter target by modeling a dependence of the deposition rate on a target life of the sputter target;

modeling a dependence of the deposition rate on at least one of deposition plasma power and deposition time, modeling said dependence of the deposition rate comprising using sensor data relating to metal deposition processing for performing said modeling; and

applying the deposition rate model to modify the metal deposition processing to form the metal layer to have a desired thickness.

32. (Original) The method of claim 31, wherein modeling the dependence of the deposition rate on the target life of the sputter target comprises modeling the dependence of the deposition rate on target lives of a plurality of previously processed sputter targets.

33. (Original) The method of claim 31, wherein modeling the dependence of the deposition rate on the at least one of the deposition plasma power and the deposition time comprises modeling the dependence of the deposition rate on both the deposition plasma power and the deposition time.

34. (Original) The method of claim 32, wherein modeling the dependence of the deposition rate on the at least one of the deposition plasma power and the deposition time comprises modeling the dependence of the deposition rate on both the deposition plasma power and the deposition time.

35. (Original) The method of claim 31, wherein applying the deposition rate model to modify the metal deposition processing comprises inverting the deposition rate model to

determine the at least one of the deposition plasma power and the deposition time to form the metal layer to have the desired thickness.

36. (Original) The method of claim 32, wherein applying the deposition rate model to modify the metal deposition processing comprises inverting the deposition rate model to determine the at least one of the deposition plasma power and the deposition time to form the metal layer to have the desired thickness.

37. (Original) The method of claim 33, wherein applying the deposition rate model to modify the metal deposition processing comprises inverting the deposition rate model to determine the deposition plasma power and the deposition time to form the metal layer to have the desired thickness.

38. (Original) The method of claim 34, wherein applying the deposition rate model to modify the metal deposition processing comprises inverting the deposition rate model to determine the deposition plasma power and the deposition time to form the metal layer to have the desired thickness.

39. (Original) The method of claim 31, wherein modeling the dependence of the deposition rate on the at least one of the deposition plasma power and the deposition time comprises fitting previously collected metal deposition processing data using at least one of polynomial curve fitting, least squares fitting, polynomial least squares fitting, non polynomial least squares fitting, weighted least squares fitting, weighted polynomial least squares fitting, and weighted non polynomial least squares fitting.

40. (Original) The method of claim 32, wherein modeling the dependence of the deposition rate on the target lives of the plurality of previously processed sputter targets comprises fitting previously collected metal deposition processing data using at least one of polynomial curve fitting, least squares fitting, polynomial least squares fitting, non polynomial least squares fitting, weighted least squares fitting, weighted polynomial least squares fitting, and weighted non polynomial least squares fitting.

41. (Currently Amended) A system comprising:

a tool monitoring consumption of a sputter target to determine a deposition rate of a metal layer during metal deposition processing using the sputter target;

a computer modeling a dependence of the deposition rate on at least one of deposition plasma power and deposition time, modeling said dependence of the deposition rate comprising using sensor data relating to metal deposition processing for performing said modeling, said computer modeling a dependence of the deposition rate [[based upon]] <u>on</u> a target life of the sputter target; and

a controller applying the deposition rate model to modify the metal deposition processing to form the metal layer to have a desired thickness.

42. (Canceled)

43. (Original) The system of claim 41, wherein the computer modeling the dependence of the deposition rate on the at least one of the deposition plasma power and the deposition time models the dependence of the deposition rate on both the deposition plasma power and the deposition time.

44. (Canceled)

45. (Original) The system of claim 41, wherein the controller applying the deposition rate model to modify the metal deposition processing inverts the deposition rate model to determine the at least one of the deposition plasma power and the deposition time to form the metal layer to have the desired thickness.

46. (Canceled)

47. (Original) The system of claim 43, wherein the controller applying the deposition rate model to modify the metal deposition processing inverts the deposition rate model to determine the deposition plasma power and the deposition time to form the metal layer to have the desired thickness.

48. (Currently Amended) The system of claim [[44]] <u>43</u>, wherein the controller applying the deposition rate model to modify the metal deposition processing inverts the deposition rate model to determine the deposition plasma power and the deposition time to form the metal layer to have the desired thickness.

49. (Original) The system of claim 41, wherein the computer modeling the dependence of the deposition rate on the at least one of the deposition plasma power and the deposition time fits previously collected metal deposition processing data using at least one of polynomial curve fitting, least squares fitting, polynomial least squares fitting, non polynomial least squares fitting, weighted least squares fitting, weighted polynomial least squares fitting, and weighted non polynomial least squares fitting.

50. (Previously Presented) The system of claim 41, wherein the tool modeling the dependence of the deposition rate on the target life of the sputter target fits previously collected

metal deposition processing data using at least one of polynomial curve fitting, least squares fitting, polynomial least squares fitting, non polynomial least squares fitting, weighted least squares fitting, weighted polynomial least squares fitting, and weighted non polynomial least squares fitting.

51. (Currently Amended) A device comprising:

means for monitoring consumption of a sputter target to determine a deposition rate of a metal layer during metal deposition processing using the sputter target;

means for modeling a dependence of the deposition rate on at least one of deposition plasma power and deposition time, modeling said dependence of the deposition rate comprising using sensor data relating to metal deposition processing for performing said modeling;

means for modeling a dependence of the deposition rate [[based upon]] on a target life of the sputter target; and

means for applying the deposition rate model to modify the metal deposition processing to form the metal layer to have a desired thickness.

52. (Original) The device of claim 51, wherein the means for monitoring the consumption of the sputter target to determine the deposition rate of the metal layer during the metal deposition processing comprises means for modeling a dependence of the deposition rate on a target life of the sputter target.

53. (Original) The device of claim 51, wherein the means for modeling the dependence of the deposition rate on the at least one of the deposition plasma power and the deposition time comprises means for modeling the dependence of the deposition rate on both the deposition plasma power and the deposition time.

54. (Original) The device of claim 52, wherein the means for modeling the dependence of the deposition rate on the at least one of the deposition plasma power and the deposition time comprises means for modeling the dependence of the deposition rate on both the deposition plasma power and the deposition time.

55. (Original) The device of claim 51, wherein the means for applying the deposition rate model to modify the metal deposition processing comprises means for inverting the deposition rate model to determine the at least one of the deposition plasma power and the deposition time to form the metal layer to have the desired thickness.

56. (Original) The device of claim 52, wherein the means for applying the deposition rate model to modify the metal deposition processing comprises means for inverting the deposition rate model to determine the at least one of the deposition plasma power and the deposition time to form the metal layer to have the desired thickness.

57. (Original) The device of claim 53, wherein the means for applying the deposition rate model to modify the metal deposition processing comprises means for inverting the deposition rate model to determine the deposition plasma power and the deposition time to form the metal layer to have the desired thickness.

58. (Original) The device of claim 54, wherein the means for applying the deposition rate model to modify the metal deposition processing comprises means for inverting the deposition rate model to determine the deposition plasma power and the deposition time to form the metal layer to have the desired thickness.

59. (Original) The device of claim 51, wherein the means for modeling the dependence of the deposition rate on the at least one of the deposition plasma power and the deposition time comprises means for fitting previously collected metal deposition processing data using at least one of polynomial curve fitting, least squares fitting, polynomial least squares fitting, non polynomial least squares fitting, weighted least squares fitting, weighted polynomial least squares fitting, and weighted non polynomial least squares fitting.

60. (Original) The device of claim 52, wherein the means for modeling the dependence of the deposition rate on the target life of the sputter target comprises means for fitting previously collected metal deposition processing data using at least one of polynomial curve fitting, least squares fitting, polynomial least squares fitting, non polynomial least squares fitting, weighted least squares fitting, weighted polynomial least squares fitting, and weighted non polynomial least squares fitting.

61. (Currently Amended) A method comprising:

monitoring consumption of a sputter target to determine a deposition rate of a metal layer during metal deposition processing using the sputter target;

modeling a dependence of the deposition rate based upon a deposition plasma power and a deposition time, modeling said dependence of the deposition rate comprising using sensor data relating to metal deposition processing for performing said modeling;

modeling said dependence of the deposition rate being [[based upon]] <u>on</u> a target life of the sputter target, said modeling comprising monitoring the consumption of sputter target on a run-to-run basis; and

inverting the deposition rate model to automatically modify the metal deposition processing on the run-to-run basis to form the metal layer to approach a predetermined thickness.

62. (New) The method of claim 1, wherein modeling the dependence of the deposition rate comprises modeling the changes in the deposition rate.

63. (New) The method of claim 62, wherein modeling the changes in the deposition rate comprises modeling the changes over a predetermined life of the sputter target.

64. (New) The method of claim 63, further comprising:

in response to the modeled changes over the predetermined life of the sputter target, automatically modifying a process recipe of the metal deposition processing.

65. (New) The method of claim 64, further comprising:

inverting the deposition rate model to determine the at least one of the deposition plasma power and the deposition time to maintain the process recipe such that the desired thickness of the metal layer remains within a target thickness on a run-to-run basis.